

RAFTING



Rafting or **whitewater rafting** is a challenging recreational activity using an inflatable [raft](#) to navigate a [river](#) or other bodies of water. This is usually done on [whitewater](#) or different degrees of rough water, in order to thrill and excite the raft passengers. The development of this activity as a leisure sport has become popular since the mid-1970s.

Whitewater rafts

The modern raft is an [inflatable boat](#), consisting of very durable, multi-layered rubberized or vinyl fabrics with several independent air chambers. The length varies between 3.5 m (11 ft) and 6 m (20 ft), the width between 1.8 m (6 ft) and 2.5 m (8 ft). The exception to this size rule is usually the [packraft](#), which is designed as a portable single-person raft and may be as small as 1.5 metres (4.9 ft) long and weigh as little as 4 pounds (1.8 kg).

Rafts come in a few different forms. In Europe, the most common is the symmetrical raft steered with a paddle at the stern. Other types are the asymmetrical, rudder-controlled raft and the symmetrical raft with central helm ([oars](#)). Rafts are usually propelled with ordinary [paddles](#) and typically hold 4 to 12 persons. In Russia, rafts are often hand made and are often a catamaran style with two inflatable tubes attached to a frame. Pairs of paddlers navigate on these rafts. [Catamaran](#) style rafts have become popular in the western United States as well, but are typically rowed instead of paddled.

Classes of whitewater

Grade 1: Very small rough areas, might require slight maneuvering. (Skill Level: Very Basic)

Grade 2: Some rough water, maybe some rocks, might require some maneuvering. (Skill Level: Basic Paddling Skill)

Grade 3: Whitewater, small waves, maybe a small drop, but no considerable danger. May require significant maneuvering. (Skill Level: Experienced paddling skills)

Grade 4: Whitewater, medium waves, maybe rocks, maybe a considerable drop, sharp maneuvers may be needed. (Skill Level: Whitewater Experience)

Grade 5: Whitewater, large waves, possibility of large rocks and hazards, possibility of a

large drop, requires precise maneuvering (Skill Level: Advanced Whitewater Experience)

Grade 6: Class 6 rapids are considered to be so dangerous as to be effectively unnavigable on a reliably safe basis. Rafters can expect to encounter substantial whitewater, huge waves, huge rocks and hazards, and/or substantial drops that will impart severe impacts beyond the structural capacities and impact ratings of almost all rafting equipment. Traversing a Class 6 rapid has a dramatically increased likelihood of ending in serious injury or death compared to lesser classes. (Skill Level: Successful completion of a Class 6 rapid without serious injury or death is widely considered to be a matter of great luck or extreme skill)

Safety

Whitewater rafting can be a dangerous sport, especially if basic safety precautions are not observed. Both commercial and private trips have seen their share of injuries and fatalities, though private travel has typically been associated with greater risk^{[[citation needed](#)]}. Depending on the area, legislated safety measures may exist for rafting operators. These range from certification of outfitters, rafts, and raft leaders, to more stringent regulations about equipment and procedures. It is generally advisable to discuss safety measures with a rafting operator before signing on for a trip. The equipment used and the qualifications of the company and raft guides are essential information to be considered.

Like most outdoor sports, rafting in general has become safer over the years. Expertise in the sport has increased, and equipment has become more specialized and increased in quality. As a result the difficulty rating of most river runs has changed. A classic example would be the [Colorado River](#) in the [Grand Canyon](#) or Jalcomulco River in Mexico, which has swallowed whole expeditions in the past, leaving only fragments of boats. In contrast, it is now run safely by commercial outfitters hundreds of times each year with relatively untrained passengers. ^[1]

Risks in whitewater rafting stem from both environmental dangers and from improper behavior. Certain features on rivers are inherently unsafe and have remained consistently so despite the passage of time. These would include "keeper hydraulics", "strainers" (e.g. fallen trees), dams (especially low-head dams, which tend to produce river-wide keeper hydraulics), undercut rocks, and of course dangerously high waterfalls. Rafting with experienced guides is the safest way to avoid such features. Even in safe areas, however, moving water can always present risks—such as when a swimmer attempts to stand up on a rocky riverbed in strong current, risking foot entrapment. Irresponsible behavior related to rafting while intoxicated has also contributed to many accidents.

One of the most simple ways to avoid injury while out of a raft, is to swim to an Eddy (a calm spot behind a rock in the water which the current disperses around) to avoid being taken downstream.

To combat the illusion that rafting is akin to an amusement park ride, and to underscore the personal responsibility each rafter faces on a trip, rafting outfitters generally require customers to sign waiver forms indicating understanding and acceptance of potential serious risks. Rafting trips often begin with safety presentations to educate customers about problems that may arise.

White water rafting is often played for the adrenaline rush and this often becomes a problem for people and their own safety. White water rafting accidents have occurred but are not common.

Due to this the overall risk level on a rafting trip with experienced guides using proper precautions is low. Thousands of people safely enjoy raft trips every year.

WINDSURFING



Windsurfing is a [surface water sport](#) using a windsurf board usually two to four meters long and powered by the effect of the wind on a sail. The rig is connected to the board by a free-rotating universal joint and comprises a mast, wishbone boom and sail. The sail area ranges from less than 3.0m² to more than 12m² depending on the conditions, the skill of the sailor and the type of windsurfing being undertaken.

Once referred to as "surfing's ginger haired cousin" by the sport's legendary champion, [Robby Naish^{\[1\]}](#), windsurfing has long struggled to present a coherent image of the sport to outsiders. Indeed, until the 1990s participants would regularly use different names to describe the sport, including **sailboarding** and **board sailing**. Despite the term "Windsurfing" becoming the accepted name for the sport, participants are still called "sailors" and not "surfers".

In fact windsurfing can be said to straddle both the laid-back culture of surf sports and the more rules-based environment of sailing. Although it might be considered a minimalistic version of a [sailboat](#), a windsurfer offers experiences that are outside the scope of any other sailing craft design. Windsurfers can perform jumps, inverted loops, spinning maneuvers, and other "freestyle" moves that cannot be matched by any sailboat. When compared to surfing, Windsurfers were the first to ride the world's largest waves, such as [Jaws](#) on the island of [Maui](#), and, with very few exceptions, it was not until the advent of [tow-in surfing](#) that waves of that size became accessible to traditional surfers. Extreme waves aside, many expert windsurfers will ride the same waves as surfers do (wind permitting) and are themselves usually very accomplished without a rig on a conventional surfboard.

The sport has a potentially shallower (longer) learning curve when compared to other so-called "extreme" sports, like [snowboarding](#), [freeride Mountain Biking](#) or [kitesurfing](#). The average beginner starting off on a 3.8m long board with a tiny triangular sail in less than 5 knots of wind on a shallow lake often struggles to see the similarity between what they are doing and the images they see in magazines of a more advanced sailor using a 2.25m board to ride waves in 20-30 knots of wind.

Key to this is the difference between [displacement](#) sailing and [hydroplaning](#) (referred to as "[planing](#)"). The former takes place in light winds (up to 10 knots) and involves the hull moving through the water using (typically) a [centreboard](#) and [fin](#) or [skeg](#) for stability and lateral resistance. Directional control is achieved via the rig and weighting one or other side the board, or sinking the tail.

When the wind gets above 8-10 knots (typically 15 knots+ for recreational equipment) the board ceases to move through the water and instead planes on top of the water, skimming over the surface at much higher speeds. To make the most of planing conditions, the board needs to be smaller and can dispense with the centreboard as sufficient lift and lateral resistance are provided by the fin (or combination of fins). When planing, changing direction is achieved via rotating the rig and engaging one of the rails (edges) of the board which is referred to as carving. Though windsurfing is possible in winds from near 0 to 50 [knots](#), the ideal planing conditions for most recreational sailors is 15-25 knots.

Beginners must develop their balance and core stability, acquire an understanding of sailing theory, and learn a range of techniques before they can progress to planing windsurfing.

Initial lessons can be taken with a Windsurfing School, which exist in reasonable numbers in most countries. With coaching and favorable conditions, the basic skills of sailing, steering, and turning can be learned within a few hours. Competence in the sport and mastery of more advanced maneuvers such as planing, carve gybing (turning downwind at speed), water starting, jumping, and more advanced moves can require lengthy practice. Training DVDs exist which are useful in a sport where it is difficult for a coach to be close to a pupil particularly when learning the more advanced maneuvers.

Nevertheless, windsurfing is a sport which, once mastered, can be enjoyed, even at an advanced level, well into retirement and then at a more sedate level for considerably longer still.^[2] This is partly down to the fact that windsurfing crashes tend to cause less injury than those sports which take place on harder surfaces (although being reckless whilst windsurfing in advanced conditions can still cause serious injury due to the speeds and altitudes involved).

Windsurfing is predominately undertaken on a non-competitive basis. Organised competition does take place at all levels across the world and typical formats for competitive windsurfing include speed sailing, slalom, course racing, wave sailing, superX, and freestyle.

The boom of the 1980s led windsurfing to be recognized as an [Olympic sport](#) in 1984. However, windsurfing's popularity saw a sharp decline in the mid-1990s, as equipment became more specialized, requiring more expertise to sail. Now the sport is experiencing a modest revival, as new beginner-friendly designs are becoming available.

BUNGEE JUMPING



Bungee jumping (also spelled "Bungy" jumping)^{[1][2]} is an activity that involves jumping from a tall structure while connected to a large elastic cord. The tall structure is usually a fixed object, such as a building, [bridge](#) or crane; but it is also possible to jump from a movable object, such as a [hot-air-balloon](#) or [helicopter](#), that has the ability to [hover](#) above the ground. The thrill comes as much from the [free-falling](#) as from the rebounds.^[3]

When the person jumps, the [cord](#) stretches and the jumper flies upwards again as the cord snaps back, and continues to oscillate up and down until all the energy is dissipated.

History

The word bungee (pronounced /'bʌndʒi:/) originates from [West Country dialect](#), meaning "Anything thick and squat", as defined by James Jennings in his book "Observations of Some of the Dialects in The West of England" published 1825. Around 1930 the name became used for a rubber [eraser](#). The word bungy, as used by [A J Hackett](#), is said to be "[Kiwi](#) slang for an Elastic Strap".^[4] Cloth-covered rubber cords with hooks on the ends have been available for decades under the generic name *bungee cords*.

In the 1950s [David Attenborough](#) and a [BBC](#) film crew brought back footage of the "land divers" of [Pentecost Island](#) in [Vanuatu](#), young men who jumped from tall wooden platforms with vines tied to their ankles as a test of their courage and passage into manhood.^[5] A similar practice, only with a much slower pace for falling, has been practiced as the [Danza de los Voladores de Papantla](#) or the 'Papantla flyers' of central [Mexico](#), a tradition dating back to the days of the [Aztecs](#).

A tower 4,000 feet high with a system to drop a "car" suspended by a cable of "best rubber" was proposed for the Chicago World Fair, 1892-1893. The car, seating two hundred people, would be shoved from a platform on the tower and then bounce to a stop. The designer engineer suggested that for safety the ground below "be covered with eight feet of feather bedding". The proposal was declined by the Fair's organizers.^[6]

The first modern bungee jumps were made on 1 April 1979 from the 250-foot [Clifton Suspension Bridge](#) in Bristol, by David Kirke, Chris Baker, Simon Keeling, Tim Hunt and [Alan Weston](#) of the [Oxford University Dangerous Sports Club](#).^[7] The jumpers were arrested

shortly after, but continued with jumps in the US from the Golden Gate and Royal Gorge bridges, (this last jump sponsored by and televised on the [American](#) program *[That's Incredible](#)*) spreading the concept worldwide. By 1982 they were jumping from mobile cranes and hot air balloons. Commercial bungee jumping began with the [New Zealander](#), [A J Hackett](#), who made his first jump from [Auckland](#)'s Greenhithe Bridge in 1986.^[8] During the following years Hackett performed a number of jumps from bridges and other structures (including the [Eiffel Tower](#)), building public interest in the sport, and opening the world's first permanent commercial bungee site; the Kawarau Bridge Bungy at [Queenstown](#) in the [South Island](#) of [New Zealand](#).^[9] Hackett remains one of the largest commercial operators, with concerns in several countries.

Despite the inherent danger of jumping from a great height, several million successful jumps have taken place since 1980. This is attributable to bungee operators rigorously conforming to standards and guidelines governing jumps, such as double checking calculations and fittings for every jump. As with any sport, injuries can still occur (see below), and there have been fatalities. A relatively common mistake in fatality cases is to use a cord that is too long. The cord should be substantially shorter than the height of the jumping platform to allow it room to stretch. When the cord reaches its natural length the jumper either starts to slow down or keeps accelerating depending upon the speed of descent. One may not even start to slow until the cord has been stretched a significant amount, because the cord's resistance to distortion is zero at the natural length, and increases only gradually after, taking some time to even equal the jumper's weight. See also [Potential energy](#) for a discussion of the spring constant and the force required to distort bungee cords and other spring-like objects.

Equipment

The elastic rope first used in bungee jumping, and still used by many commercial operators, is factory-produced braided shock cord. This consists of many [latex](#) strands enclosed in a tough outer cover. The outer cover may be applied when the latex is pre-stressed, so that the cord's resistance to extension is already significant at the cord's natural length. This gives a harder, sharper bounce. The braided cover also provides significant durability benefits. Other operators, including A J Hackett and most [southern-hemisphere](#) operators, use unbraided cords in which the latex strands are exposed (pictured at right). These give a softer, longer bounce and can be home-produced.

Although there is a certain elegance in using only a simple ankle attachment, accidents in which participants became detached led many commercial operators to use a [body harness](#), if only as a backup for an ankle attachment. Body harnesses are generally derived from climbing equipment rather than parachute equipment.

Retrieval methods vary according to the site used. [Mobile cranes](#) provide the greatest recovery speed and flexibility, the jumper being lowered rapidly to ground level and detached. Many other mechanisms have been devised according to the nature of the jump platform and the need for a rapid turn-around.

The highest jump



Looking down from atop the Verzasca Dam bungee tower near [Locarno](#) in [Ticino](#), Switzerland

In August 2005, AJ Hackett added a SkyJump to the [Macau Tower](#), making it the world's highest jump at 233 metres (760 ft).^[10] The SkyJump did not qualify as the world's highest *bungee* as it is not strictly speaking a bungee jump, but instead what is referred to as a 'Decelerator-Descent' jump, using a steel cable and decelerator system, rather than an elastic rope. On 17 December 2006, The Macau Tower started operating a proper bungee jump, which became the "Highest Commercial Bungee Jump In The World" according to the Guinness Book of Records. The Macau Tower Bungee does have a "Guide cable" system which limits swing (the jump is very close to the structure of the tower itself) but does not have any effect on the speed of descent, so this still qualifies the jump for the World Record.

There is another commercial bungee jump currently in operation which is just 13m smaller, at 220 metres (720 ft). This jump, which is made without guide ropes, is located near Locarno, Switzerland and takes place from the top of the [Verzasca Dam](#) (pictured). This jump was prominently featured in the opening scene of the [James Bond](#) film [GoldenEye](#).

The [Bloukrans Bridge](#) in South Africa and the Verzasca Dam jumps are pure freefall swinging bungee from a single cord.

[Bloukrans Bridge](#) was opened in 1997 and uses a pendulum bungee system. It is 216m high, from the platform to the river below.^[11]

Guinness only records jumps from fixed objects to guarantee the accuracy of the measurement. John Kockleman however recorded a 2,200-foot (670 m) bungee jump from a hot air balloon in California in 1989. In 1991 Andrew Salisbury jumped from 9,000 feet (2,700 m) from a helicopter over Cancun for a television program and with Reebok sponsorship. The full stretch was recorded at 3,157 feet (962 m). He landed safely under parachute.

One commercial jump higher than all others is at the [Royal Gorge Bridge](#) in Colorado. The height of the platform is 321 metres (1,053 ft). However, this jump is rarely available, as part of the Royal Gorge Go Fast Games—first in 2005, then again in 2007

Safety and possible injury

There is a wide spectrum of possible injuries during a jump. One can be injured during a jump if the safety harness fails, the cord elasticity is miscalculated, or the cord is not properly connected to the jump platform. In most cases this is a result of human error in the form of

mishandled harness preparation. Another major injury is if the jumper experiences cord entanglement with their own body. Other injuries include [eye trauma](#)^{[14][15]}, [rope burn](#), [uterine prolapse](#), [dislocations](#), [bruises](#), [whiplash](#), [pinched fingers](#) and [back injury](#).

Age, equipment, experience, location and weight are some of the factors, and nervousness can exacerbate eye traumas ^{[16] [17]}.

In 1997, Laura Patterson, one of a 16-member professional bungee jumping team, died of massive [cranial](#) trauma when she jumped from the top level of the [Louisiana Superdome](#) with improperly handled bungee cords and collided head-first into the concrete-based playing field. She was practicing for an exhibition intended to be performed during the [halftime show](#) of [Super Bowl XXXI](#). The bungee jumping portion of the show was removed from the program and a commemoration of Patterson was added.